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ABSTRACT

The Program for International Student Assessment (PISA) is a study of comparisons. Subjects, 15-year-old students from 32 participating countries, were compared in their abilities to "use literacy knowledge and skills to meet real-life challenges," as assessed on a two-hour, paper-and-pencil test. Students also responded to a questionnaire related to a range of individual, home, and school factors. Principals of participating schools were also asked to complete a survey. Survey data were analyzed relative to reading literacy test performance to find possible explanations for cross-national patterns of strengths and weaknesses. This report begins with a discussion of current conceptions of literacy and the extent to which PISA's guiding notions are aligned with them. The report then follows with a critique of certain measurement practices in the PISA initiative. Next, it summarizes key findings from PISA and offers potential policy guidelines based on the findings. The report analyzes and interprets the three PISA documents published at the time of writing (OECD, 2001, 2002a, 2002b) and from them draws implications for action offering policy and practice. It notes that offering policy recommendations that account for all 32 countries is fraught with danger, but, with caveats and cautions, the report attempts to satisfy the charge given to the PISA Task Force by making necessary global yet legitimate recommendations for consideration by the International Reading Association. Contains 5 references and an exploratory analysis of relationships between gender and achievement. (NKA)

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Policy and Practice Implications of the Program for International Student Assessment (PISA) 2000

Report of the International Reading Association PISA Task Force April 2003

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Introduction

Comparisons are odious
— Sir Richard Francis Burton

Compare her face with some that I shall show,
And it will make thee think thy swan a crow.
— William Shakespeare

The challenges and pitfalls of comparing individuals, groups, and nations are legion. Yet, compulsively, social scientists and psychometricians measure, gauge, and scale the abilities, talents, and performances of peoples from diverse walks of life and disparate regions of the globe, all in an effort to *compare*. What is learned by these comparisons depends in no small way on how thoroughly those taking the measurements understand what makes each individual or group being measured unique, and what makes each cultural context different from others. Without these understandings, data are easily misinterpreted, and generalizations too easily oversimplified.

For example, plans for reforming education by policy makers in the United States nearly always include calls for additional resources. Many assert that eroding school infrastructures and classroom overcrowding have a direct negative influence on student achievement. This argument may be intuitively appealing, but it fails to explain why students in countries with vast overcrowding, crumbling school buildings, scant books for students or professional materials for teachers, and miniscule teacher salaries have higher literacy rates and achievement levels than students in the United States. To explain these differences adequately, we need to think discursively about the sociocultural context of literacy in each nation, about the values each nation places on the literate health of its youth and the ways those values are enacted daily by the adults who influence children's lives.

The Program for International Student Assessment (PISA), like its predecessors, the International Association for the Evaluation of Educational Achievement's Reading Literacy initiatives, is a study of comparisons. Fifteen-year-old students from 32 participating countries were compared in their abilities to "use literacy knowledge and skills to meet real-life challenges" (Organisation for Economic Co-operation and Development [OECD], 2001, p. 16), as assessed on a two-hour, paper-and-pencil test. Students also responded to a questionnaire related to a range of individual, home, and school factors. Principals of participating schools were also asked to complete a survey. Survey data were analyzed relative to reading literacy test performance in order to find possible explanations for cross-national patterns of strengths and weaknesses. (For more information, see the OECD website, at <http://www.pisa.oecd.org/>.)

This report begins with a discussion of current conceptions of literacy and the extent to which PISA's guiding notions are aligned with them. This is followed by a critique of certain measurement practices in the PISA initiative. Next, we summarize key findings from PISA and offer potential policy guidelines based on the findings. Offering policy recommendations that account for all 32 participating countries is fraught with danger, for all of the reasons we have just raised. Nonetheless, with caveats and cautions, we attempt to satisfy the charge given to the PISA Task Force by making necessarily global yet legitimate recommendations for consideration by the International Reading Association.

This report analyzes and interprets the three PISA documents published at the time of writing (OECD, 2001, 2002a, 2002b), and from them draws implications for action affecting policy and practice. Statements followed by page numbers refer to the main PISA report, *Knowledge and Skills for Life*, which substantiates them. Those substantiated in the subsequent *Education Policy Analysis* report are flagged with the letters EPA, while those substantiated in the *Reading for Change* report are flagged RFC.

Conceptual and Methodological Issues

1. Definition of Literacy/Literacies

Performance in literacy is as strong a predictor of employment prospects as is level of overall educational qualifications (p. 21) — that is, literacy is important. But what do we mean by literacy? Is there a difference between schooled literacy and literacy for later life and work? The PISA study set out to assess literacy in a multidimensional way, which tapped multiple literacies — "the ability to understand, reflect on and use written texts in order to achieve one's goals and participate effectively in society." This broad definition of literacy encompasses the ability of students to deal with a wide range of written materials, in the context of different reading events at and beyond school. The emphasis in the PISA study was on measuring "reading for learning," not "learning to read." The focus was on higher order reading comprehension and the application of reading skills in problem solving. The assessments allowed for open and divergent, as well as closed, responses.

2. Critique of PISA Research Methodology

The PISA reports show painstaking consideration for the methodological problems of large-scale international comparisons. There are considerable differences between countries in the amount of preschool education, the age of entry to formal schooling, the structure of school systems, the resources given to schools, community resources such as libraries, the training of teachers, and the general learning culture. Strenuous efforts were made to ensure the cultural appropriateness of items. However, the PISA reports readily acknowledge many remaining limitations in methodology and data, and frequently caution that association or correlation does not imply causation.

Despite these efforts, concerns remain. Some composite variables of uncertain validity were constructed. Translation into sundry languages might have introduced error. The self-report data are of especially uncertain reliability and validity. Some questions might have been difficult to understand or interpret in some cultures. There might have been cultural differences in respondent motivation or fatigue. Respondents might have had difficulty in benchmarking their responses against local or culturally specific conceptions of "normality." There might have been cultural differences in social desirability bias, or the likelihood of "yea saying." The constraints of response options might raise questions about the scalar and psychometric properties of the ensuing data, and their amenability to statistical analysis.

Data dependent upon the responses of school principals are of particular concern, since these respondents were few in number (only 150 in some countries) and their reports were not triangulated against any other comparable source, such as teachers or school administrators or inspectors. Furthermore, the principals' responses were weighted by school enrollment, so the conclusions might be biased by the views of principals of larger schools. Additionally, the focus on within-school factors for 15-year-old students in secondary or high schools disregards the impact of previous schooling at earlier levels. Beyond this, in some cases data were missing or numbers in cells were too few to permit interpretation. Sometimes data were censored at the request of a particular country. Consequently, in what follows, only the stronger associations are discussed.

Additionally, PISA does not provide answers about which policies lead to success in any given country; each country has to look for its own answer. The study does not provide evidence about reading instruction, national curricula, or preferred teaching strategies. Further, the 15-year-olds assessed were enrolled in quite different classes at different levels (due to differences in school promotion policies and entrance ages in the various countries), and it is not possible to obtain information about curricula, classroom factors, or instructional methods experienced by the students at the time of the study. Any specific recommendations about reading instruction in particular countries can therefore not be directly

substantiated. However, the study can provide pointers for policy, especially with respect to factors that appear consistently across a great many countries (EPA). Additional surveys of students in other age groups and levels of the educational system are necessary for wider interpretation of the results. Crossreference to the Progress in Reading Literacy Study (PIRLS) with the fourth-grade population (see, e.g., Bos et al., 2003; Campbell et al., 2001) could enrich the interpretation of national results — for instance, by providing information about the stage in schooling at which the performance gap between students from different social backgrounds begins to appear.

However, on the basis of comparative international analyses such as PISA, educators in different countries can learn more about their areas of strength and weakness, and can identify characteristics relevant for educational policy. With regard to quality and equality, the PISA results are useful for

- Assessing the relative standing of each country with regard to the overall level of performance, as well as the variance
- Identifying groups of at-risk students with literacy skills at or below competence level
- Identifying the characteristics of students who perform poorly (which may vary from country to country)

In sum, the International Reading Association applauds the PISA work and, in particular, the broad definition of literacy employed in the study and the strenuous efforts made to countervail cultural differences. However, there are clear limitations to the data, and this should be borne in mind in the event of continuing analyses of smaller differences. Alignment with other international studies and further work is necessary.

Key Findings and Specific Recommendations

3. Differences Between Participating Nations

It should first be noted that more variation was evident within countries than between them (p. 51). However, large differences were evident among countries with respect to the proportion of within-school versus between-school variance. For example, Hungary showed high between-school variation and low within-school variation (possibly owing to different school types), while Norway had very low between-school variation and very high within-school variation (p. 61). This might reflect the relative effect of national or school system factors versus within-school factors, including school type; school location in particular state, territory, or province, or in urban or rural settings; the population of ethnic or linguistic minorities served; and the public-private school balance (p. 63). Students might be selected differentially or self-select less demanding schools or programs (p. 64).

National and local governments and research agencies should continually monitor the relative contributions to variance in student achievement attributable to within-school and between-school variance, since they have very different implications for policy and practice. (Indeed, the need for monitoring permeates many of these recommendations.)

Also, it should be remembered that 15-year-old students can be found in different school years or grade levels in different countries (pp. 56-57). These students might also attend very different types of schools. The school dropout rate prior to age 16 might also be very different in different countries, as might grade repetition where the grade system exists. Cross-sectional studies at a given student age should therefore seek to take into account differences in student placement in different school systems, and the biasing effects of attrition through differential dropout and grade-retention rates.

The assessment sampled different aspects of literacy, and some countries did differentially well on different aspects (p. 45). For example, students in Finland performed extremely well on reading for information retrieval but much less well on reflection and evaluation, while in other countries (e.g., Canada and the United Kingdom) more balance was noted (p. 45). Some of the countries with the lowest overall performance score better on the reflection and evaluation subscale than on the retrieving information subscale (RFC). Assessments of reading skills that explore these differences are extremely helpful. Such assessments could usefully be made available to all countries in multiple languages, to enable ongoing formative and summative assessment at the student, class, school, or school system level.

Since demands for more fluent information retrieval and processing, along with reflection and evaluation, are likely to increase in future, literacy instruction that is balanced in these respects is desirable. There are implications here for the provision of an adequate quantity of high-quality pre- and in-service training for teachers, so that they can develop a thorough conceptual and practical understanding of the multiple aspects of the literacy process that will make balanced literacy instruction possible.

Distribution of reading capability also varied. Some countries had a high proportion of very capable readers but also a high proportion of very incapable readers (e.g., New Zealand), while others had a high proportion of capable readers but relatively few of very low or high capability (e.g., Korea, Japan) (pp. 46-47). Correspondingly, the difference between the 25th and 75th percentile was much greater in some countries (e.g., United States) than others (e.g., Korea) (pp. 57-58). The three countries with the smallest difference — Korea, Japan, and Finland — were also among the best performing. Thus, it appears that quality and equity do not have to compete (EPA).

National and local governments should continue to monitor the distribution and relative equality of reading achievement in light of these international comparisons. Governments should also develop and evaluate pilot implementations of policies and practices relevant to their cultural context that are designed to reduce inequality of reading achievement. Such inequality is far from inevitable. Although the International Reading Association could list appropriate practices with an evidence base of success, it could not guarantee the success of individual practices in particular cultural contexts.

Note, too, that the grading system used within countries might not relate to international benchmarks. Thus, in a country with overall poor performance (e.g., Mexico), students might still be performing at the level expected by their teachers and school system (p. 50). National and local governments should therefore explore teacher expectations of students and ensure that they are informed by international comparisons as well as local history and tradition. The content of the curriculum and methods for its delivery should also be scrutinized. In some countries where performance does not associate with the grading system, the literacy content might focus more on products and facts than on thinking processes.

4. Impact of Student Characteristics

The impact of the overall socioeconomic status (SES) of the school population was greater than that of the socioeconomic status of individual students (p. 64). National and local governments should therefore ensure that teachers are aware of the impact of the socioeconomic ethos and culture of a school upon individual students and seek to manage the social psychology of the learning environment.

On the individual student level, the majority of the least capable students were males of low socioeconomic status (pp. 48-49). This group should be targeted at an early age, with preventive measures — particularly to raise engagement with reading — intended to reduce the risk of later failure.

Overall, student engagement in reading had a greater influence on achievement than did socioeconomic status or parental occupation (EPA). "Motivation to read and amount of time spent reading are important

contributors to the gap between good and poor readers" (RFC). Interest in reading did show a positive correlation with achievement, but with great variation among countries. For example, Korean students showed low interest in reading but high achievement, whereas for Mexico, the reverse was true (p. 100). Within countries, high interest was more consistently correlated with high achievement. However, many students reported low levels of engagement in reading (p. 104).

Schools should, of course, seek to foster student interest in a wide range of reading activities. It is important to be aware, however, that sustaining high engagement with reading is more important, and that high interest does not lead automatically to high engagement. Schools should also be aware of the dangers of student socioeconomic status conditioning teacher expectations of pupils. Reading engagement should not be ignored in establishing expectations, particularly since teachers have more potential control over this factor.

Many students showed high interest in using computers for learning activities, but this was truer for males than females. This interest was correlated with higher reading performance (p. 116). Schools should seek to make available many rich opportunities for accessing and evaluating reading through computers and the Internet. This might be a particularly valuable approach with boys of low socioeconomic status who also have low engagement in reading.

Schools should also consider their methods of reading instruction, to ensure that implicit cultural or gender bias are not present.

Females outperformed males on the combined reading literacy scale in all participating countries (p. 122). Females were more reflective and evaluative in their approach to reading (p. 125) and spent much more time reading for enjoyment than did males (p. 131). "The large performance difference that exists between boys and girls in reading literacy can partly be explained by other differences such as engagement in reading" (RFC). However, "males in some countries are more engaged in reading than females in other countries. For instance, males in Denmark, Finland, Iceland, Japan and Korea report being either as engaged or more engaged in reading than females in Belgium, France and Spain" (RFC).

Females read more fiction than males, who read more newspapers, comics, e-mail messages, and webpages (p. 132). However, "the gap in reading proficiency between those reading comics and those reading fiction is not huge. Daily engagement in reading magazines, newspapers and comics — a kind of reading that is perhaps less valued by school than fiction books — seems, at least in some cultural contexts, to be a fruitful way of becoming a proficient reader" (RFC). "Reading practices can play an important role in reducing the gap between the reading proficiency scores of students from different socio-economic backgrounds and in reducing the gap seen between males and females" (RFC).

Schools should consider the definitions, models, and expectations of literacy embedded in school and teacher culture and seek to broaden these to afford equal opportunities to wide forms of reading engagement. Schools should also pay special attention to female teachers, who might tend to convey their own values and attitudes, as well as their reading preferences, to students.

In this report, the task force has confined its deliberations to the PISA data and to recommendations stemming directly from those. However, it can be argued that deeper analysis is needed of intermediate variables underpinning the PISA findings. As an example, the issue of male underachievement is the subject of such an exploration in the appendix.

5. Impact of Family Characteristics

A socioeconomic index of parental occupation correlated strongly with achievement, accounting for 11% of the variance in literacy achievement (p. 139). However, the performance gap between high and low SES students was much greater in some countries (e.g., Germany, Belgium, Switzerland) than in others (e.g., Korea, Finland, Iceland). Wealth was less strongly associated with achievement, with U.S. students showing the largest variation on this factor. On the other hand, possession of cultural items in the home was strongly related to achievement (p. 144). It is evident that a high average quality and equality of outcomes among students from various backgrounds can be achieved. While social background has a strong association with student performance, in some countries this influence is less powerful than in others. "Fifteen-year-olds whose parents have the lowest occupational status but who are highly engaged in reading achieve better reading scores than students whose parents have high or medium occupational status but who are poorly engaged in reading" (RFC).

National and local governments should continue to monitor the distribution and relative equality of reading achievement in light of student socioeconomic status. Governments should also develop and evaluate pilot implementations of policies and practices relevant to their cultural contexts that are designed to reduce inequity in reading achievement according to socioeconomic status. Such inequity is far from inevitable.

Schools should also be aware of the dangers of conditioning expectations of pupils by parental wealth, while ignoring parental occupation and the possession of cultural items. In the case of the latter, schools might have some potential control through libraries and loan schemes. Schools should work to ensure that in classrooms, school libraries, and elsewhere, students are surrounded by new, interesting, and diverse reading materials, and teachers should work to facilitate access to those materials. Schools, together with local authorities and institutions, should develop culturally relevant programs to reduce inequality of opportunity and cultural bias. The International Reading Association's network of national affiliates might have here a good opportunity for their work.

An index of parental involvement in, support of, and communication about student learning was positively correlated with achievement (p. 147). Single-parent family status was negatively correlated with achievement, but much of this variance was attributable to poverty (p. 132). Initiatives and practices that enhance parental engagement with their children's education should be established. Although this might be more difficult in the case of parents of older students, it is nonetheless essential. Where parental capability for providing support is limited, mentoring schemes might be developed, implemented, and evaluated.

Students who spoke the language of assessment or another national language at home most of the time ("majority-language students") performed better than students who routinely conversed with their parents and siblings in another language ("minority-language students") (pp. 155-156). Immigration status was likewise correlated with achievement: Students born abroad or with foreign-born parents showed lower achievement than their peers, even after accounting for other characteristics (EPA). Schemes to provide support to students who are learning the language of instruction as an additional language face many acknowledged difficulties. Nevertheless, they are clearly not as effective as is desirable. Further development and dissemination of effective evidence-based practices is needed, together with rigorous quality control.

6. Impact of School and Teaching and Learning Characteristics

It must first be noted that many findings in this area are based primarily on students' self-reports. They must therefore be treated with caution. In addition, it has already been noted (see section 4) that the

impact on achievement of the overall SES of the school population was greater than that of the individual student SES (p. 64).

Student strategic self-management of learning was associated with higher achievement (p. 110), with females reporting more frequent use of strategic self-management than males (p. 133). If the prevailing culture does not currently emphasize self-management, this needs to be introduced to give some balance to learning opportunities and to prepare students for self-management in future schooling and employment. The difficulty of this for teachers unused to such approaches is acknowledged.

Instructional strategies that emphasize memorization were more positively related to achievement than were memorization strategies, for which outcomes were mixed (p. 112). Males reported using more elaboration than females; females reported using more memorization than males (p. 133). However, this does not align with the gender differential in tested reading style reported above. Where they are not in use, elaboration strategies should be introduced. Both pre- and in-service training for teachers should be provided, to enhance understanding of deeper learning processes and to promote richer approaches to teaching and learning.

School principals complain of student absenteeism and disruption, while students complain of time wasted at the beginning of lessons (p. 164). Both issues are concerned with time on task at learning. Teachers, schools, and students should work together to establish a consensus on local barriers to effective learning, identify and implement revised policies and practices, and evaluate the outcomes.

Language and literacy teachers' demonstration of interest in students, facilitation of student response, and assurance of student mastery had a weak or mixed association with achievement, perhaps because less able pupils need more of these types of support (p. 161). Note, though, that the comparability of student expectations and perceptions among countries is particularly questionable here.

"In 19 of the 28 OECD countries and in two of the four non-OECD countries, the correlation of achievement pressure with reading achievement is negative" (RFC). The association between such pressure and reading engagement was also largely negative. Schools and teachers should be aware that pressuring students to read is counterproductive. Students should be consulted in an effort to identify alternative practices that might be more successful, and such practices should subsequently be evaluated.

7. School Resourcing, Management, and Leadership

A modest correlation was evident between level of school resourcing and student achievement, though some countries with relatively low spending per student showed good outcomes. Countries that appeared to spend relatively ineffectively included Denmark, Greece, Italy, Mexico, Portugal, and the United States (p. 91). Thus, "spending alone does not guarantee better outcomes" (EPA). Some countries achieve high performance with relatively limited resources, and vice versa.

Where additional resources are made available to schools, the effectiveness of their deployment should be evaluated, with feedback affecting any subsequent resourcing. However, in countries that are currently spending relatively ineffectively, the lack of effectiveness should not be used as a basis for refusal to devote additional resources to high-quality literacy programs if the utility of those resources can be evaluated. Nor should this general finding be used to reduce the funding for programs that have been evaluated and found to be effective — or, indeed, for those that have yet to be evaluated, provided that a plan for evaluation exists.

The quality of buildings and other physical resources was only weakly associated with achievement, but the quality of educational resources was more strongly associated (p. 174). When faced with budgetary

choices, schools should therefore be aware that expenditure for learning resources is likely to be more effective in raising achievement than expenditure on buildings, provided the resources acquired are used appropriately and effectively.

Teachers with better qualifications were associated with higher student achievement (p. 204). It should be noted, of course, that these qualifications might incorporate very different approaches or concentrations with respect to literacy instruction. Teachers should be encouraged and supported to improve their qualifications, provided the learning experiences involved are relevant to the demands of their positions and delivered to high quality standards.

School autonomy and teacher autonomy were both positively associated with higher achievement (p. 177), although it is possible that public versus private schooling was a confounding variable here. National and local governments, schools, and teachers should note that central prescription of teaching practices does not appear to raise standards — in fact, it has the converse effect — and act accordingly.

Systems with fewer types of school and less selection of pupils were associated with higher performance and fewer differences in student outcomes. National and local governments, schools, and teachers should note that multiple school types and consequent student selection does not appear to raise standards — in fact, the converse — and act accordingly.

Finally, staff-student ratio (SSR) showed a curvilinear relationship with student achievement. At ratios less than 1:10, student performance was worse — possibly because the most problematic students tend to be taught in the smallest classes. Between 1:10 and 1:25, the relationship with achievement showed little variation. Above 1:25, student achievement began to decline as SSR increased, with the decline growing more notable when SSR moved higher than 1:40 (p. 202). This finding was consistent across many countries. Where possible, therefore, SSR of between 1:10 and 1:25 should be the goal.

Summary of Recommendations in Three Critical Areas

In the preceding analysis of key findings, each finding is followed by a recommendation or recommendations. In this section of the report, we bring the recommendations together to focus on three major areas: achieving high performance and equity, fostering boys' reading performance, and implications of PISA 2000 for instruction.

8. Achieving High Performance and Equity

Among the most striking findings of PISA is that the relationship between level of reading performance and the distribution of reading capability was highly variable. Some countries had high proportions of both very capable and very incapable readers, while others had high proportions of capable readers and relatively low proportions of either very capable or very incapable readers. Correspondingly, the difference between the 25th and 75th percentile reading performance was much higher in some countries than in others. The three countries with the smallest difference were also among the best performing. Thus, it is clear that quality and equity do not have to compete. Frequently, where disparities in performance do exist, they are related to socioeconomic factors. However, in some countries, these factors have much less influence on reading performance.

National and local governments should continue to monitor the distribution and relative equality of reading achievement in light of international comparisons and socioeconomic factors. They should also develop and evaluate pilot implementations of policies and practices relevant to their cultural contexts that are designed to reduce inequity in reading achievement. Such inequality is far from inevitable.

Another factor contributing to inequality is between-school differences in reading performance. National and local governments and research agencies should monitor the relative contributions to variance in student achievement attributable to within-school and between-school factors, since they have very different implications for policy and practice. National and local governments, schools, and teachers should note that multiple school types and consequent student selection do not appear to raise standards — in fact, they have the opposite effect — and act accordingly.

Another factor that may contribute to inequality is teacher expectations. National and local governments should explore teacher expectations of students and ensure that they are informed by international comparisons as well as by local history and tradition. For example, in countries where there are large disparities in performance, teachers should be informed that such disparities are not inevitable and, in fact, they do not exist in many countries. In addition, governments should ensure that schools and teachers are aware of the impact of the socioeconomic ethos and culture of a school upon individual students and seek to manage the social psychology of the learning environment.

In the area of educational resources, the PISA study indicates that the availability of resources does not necessarily affect reading performance. Where additional resources are made available to schools, the effectiveness of their subsequent deployment should be evaluated, with that evaluation informing provision and use of subsequent resources. However, in countries where, in general, spending on resources is relatively ineffective, that ineffectiveness should not be used as a basis for refusal to devote additional resources to high-quality literacy programs, if the effectiveness of the deployment of those resources can be evaluated. Nor should a general finding be used to reduce the funding for programs that have been evaluated and found to be effective — or, indeed, for those which have yet to be evaluated (provided that a plan for evaluation is developed). Faced with budgetary choices, schools should be aware that expenditures on learning resources are likely to be more effective in raising achievement than expenditure on buildings, provided those resources are used appropriately and effectively.

9. Fostering Gains in Boys' Reading Performance

Another striking finding of the PISA study is that, in every participating country, females outperform males in reading. Special intervention targeted to males is indicated. The data suggest that males of low socioeconomic status should be targeted at an early age with preventive measures — particularly those designed to raise engagement with reading — intended to reduce the risk of later failure. In this regard, making available many rich opportunities for accessing and evaluating reading through computers and the Internet may be valuable, particularly with boys of low socioeconomic status who show little engagement in reading.

Schools should also consider their methods of reading instruction, to ensure that implicit cultural or gender bias is not present. They should consider the definitions, models, and expectations of literacy embedded in school and teacher culture and seek to broaden these to afford equal opportunities to wider forms of reading engagement. Schools also should pay special attention to female teachers, who might tend to reproduce their own values, attitudes, and reading preferences.

See the Appendix for more on this topic.

10. Implications for Instruction

The results of the PISA study indicate that there are significant differences among types of reading. Assessments of reading skills that explore differences between reading for information retrieval and for reflection and evaluation are extremely helpful. Such assessments could usefully be made available to all

countries in multiple languages, to enable ongoing formative and summative assessment at the student, class, school, or school system level. In the future, demands on individual literacy abilities are likely to include more fluent information retrieval and processing along with reflection and evaluation, so literacy instruction that is balanced in these respects is desirable. There are implications here for the provision of an adequate quantity of high-quality preservice and in-service training for teachers, to ensure that they have a thorough conceptual and practical understanding of the multiple aspects of the literacy process. This should make balanced literacy instruction possible.

In some countries there are weak relationships between the PISA performance data and the grading system — that is, the grading system has either larger or smaller proportions of students performing in the upper and lower ranges of the distribution. In these situations, the content of the curriculum and methods for its delivery should be scrutinized. It may be that the literacy focus is more on products and facts than on thinking processes.

Another powerful finding of the PISA report regards the relationship between engagement and performance. The effect of high engagement can mitigate the effect of socioeconomic status. Schools should therefore be aware of the dangers of conditioning their expectations of pupils by socioeconomic status, while ignoring the reading engagement factor, over which they have more potential influence. Of course, schools should also seek to foster students' high interest in a wide range of reading activity, while being aware that sustaining high engagement with reading is more important, and that the one does not lead automatically to the other.

Since performance was associated with access to reading materials and cultural artifacts, schools should work to ensure that all students are surrounded in their classrooms, school libraries, and elsewhere by new, interesting, and diverse reading materials, and teachers should work to facilitate access to those materials. Schools and local authorities and institutions should develop culturally relevant programs to reduce inequity of opportunity and cultural bias. The IRA network of national affiliates might have here a good opportunity for their work.

Self-management and elaboration strategies were consistently related to reading performance. Where the prevailing culture does not emphasize student strategic self-management of learning and use of elaboration, this needs to be introduced to give some balance to learning opportunities and prepare students for an unpredictable but undoubtedly rapid-paced future. The difficulty of this for teachers unused to such approaches is acknowledged, and both pre- and in-service training for teachers should be provided to enhance understanding of deeper learning processes and to promote richer process approaches to teaching and learning.

Pressure on students to perform was negatively association with reading performance. Schools and teachers should be aware that pressuring students to read is counterproductive, and teachers should consult with students to identify alternative practices that might be more successful. Such practices should subsequently be evaluated.

Because teacher qualifications are associated positively with reading performance, teachers should be encouraged and supported to improve their qualifications, provided the learning experiences involved are relevant to the demands of their post and delivered to high standards of quality. National and local governments, schools, and teachers should note that central prescription of teaching practices does not appear to raise standards — in fact, the converse — and act accordingly.

National and local governments, schools, teachers, and other vested interests should note that reducing the staff:student ratio has no measurable effect on achievement within the band 1:10 through 1:25 (and might have deleterious effects at lower ratios) and act accordingly.

Current schemes to afford additional support to students learning the native language as an additional language are clearly not as effective as is desirable, although the many difficulties in this area are acknowledged. Further development and dissemination of effective evidence-based practices is needed, together with rigorous quality control.

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Appendix:
An Exploratory Analysis of Relationships Between Gender and Achievement

In most countries involved in the PISA study, the majority of the 18% of students (on average) unable to reach the first of five proficiency levels or who reached only Level 1 (which required the most basic type of thinking about text) were male. In the United States, for instance, while the achievement gap between boys and girls in math and science has narrowed to near negligible differences, the disparity in reading has been increasing over the past decade. In 1992, the National Assessment of Educational Progress (see http://nces.ed.gov/nationsreportcard/) reading test results placed 12th grade boys on average 10 points lower than girls. By 1998, however, the difference had increased to 15 points.

This global pattern of female superiority in reading literacy deserves careful analysis. Three salient explanations have been offered as having a direct bearing on these findings. First, it has been argued that television and other popular electronic media have enjoyed an inordinate degree of cultural penetration around the world, promoting iconographic and stereotypic models of gendered behavior. Boys and men are cast as "action figures" while girls and women are more often displayed in passive, nurturing, and domestic roles. Stereotypic models of masculinity leave little room for contemplative or quiet moods necessary for traditional book reading. Impressionable youth who spend many hours with these media are indoctrinated into a kind of gender cult that polices how boys and girls act and with whom they interact. Furthermore, time spent with these media displaces time young people could be spending with traditional print sources.

For children of color, or for those in lower socioeconomic communities, gender policing could be said to reach totalitarian levels. For some, being branded a "schoolboy" might mean a life of verbal and physical abuse. Personal narratives of African American and Latino Americans who by dint of sheer perseverance and personal effort were able to rise above their economically and academically disadvantaged circumstances tell of harrowing experiences of hiding books as gang members closed in, outwardly playing the fool while working diligently on schoolwork at home, and other such survival tactics.

Another interesting explanation has to do with what some have termed our "feminized" school environments. In the United States, for example, 75% of classroom teachers are women. At the elementary level, the percentage of female teachers is above 90%. While PISA reports do not include gender statistics for teachers globally, other PISA countries' (e.g., Canada, Australia, the United Kingdom) teaching forces have a similar gender make-up to that seen in the United States. Precisely how this affects boys' literacy development and perceptions is not clear; however, some have speculated that female teachers have expectations for classroom decorum and sanction certain texts that may be in conflict with young men's sense of how males behave and what they read. When this phenomenon is considered in combination with the influence of popular media on boys' developing perceptions of masculinity, it becomes easier to understand why many male youth may be rejecting reading on the grounds that "it's a girl thing."

A third explanation is related to the matter of which texts are sanctioned in secondary school language arts curricula. The PISA reading literacy reports take great pains to emphasize the importance of reading engagement for achievement. Engagement is a multidimensional factor concerned with students' levels of interest in learning and their abilities to control the learning process. If boys are repeatedly asked to read books unrelated to their needs and interests, they may become disengaged learners. It is important to point out that the narrowest gap in performance between boys and girls was on tasks related to noncontinuous text (such as responding to questions about graphs and charts), suggesting that these types of reading tasks are more interesting to boys.

To propose broad, gender-specific recommendations for reading literacy improvement is to risk another form of sexual stereotyping. With respect to adolescent males, thinking about them monolithically, as though there is only one way to be masculine, may lead to literacy schemes that fail to meet the unique needs of particular boys. Nonetheless, adolescence is a period marked by enormous peer pressure, and there is plenty of evidence to suggest that many teenage boys are turning off reading because of actual and likely recrimination and reprisals from male classmates who associate traditional book literacy with "schoolboys," "nerds," and "poofters."

Addressing the phenomenon that boys underachieve in reading literacy across the globe will require culturally sensitive and multidimensional initiatives. One overarching guideline, however, must be the recognition that reading material matters. Teachers everywhere in the world who are interested in providing a responsive literacy curriculum for boys must make an effort to discover what boys might already like to read and what they like to do, in order to introduce them to reading material related to their outside-of-school interests. Language teachers who cling to their particular country's corpus of canonical texts will need to make room for new, alternative texts that have greater appeal to adolescent male readers.

Since reading engagement appears to compensate for risk-of-failure characteristics, such as low socioeconomic status and gender, every effort should be made to provide adolescent boys with language arts schemes that enlist their active participation, capture their imaginations, and provide them tools for controlling their own academic destinies.

Finally, it is unrealistic to expect the gender make-up of our global teaching force will change on its own; therefore, greater effort should be made to recruit more male teachers, especially in countries where their numbers are limited. This recommendation presumes that boys are in need of many more interactions with adult literate models who are male to help reinforce a connection between active literacy and masculine identity.

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